

8 suspected noise-inducing codebook excitation vector from is not continuously
9 generated;

10 wherein the input signal comprises a plurality of subframes, the subframes
11 encoded at half-rate or greater, at least a portion of the subframes have a zero or
12 low-level input, and each of the subframes having the zero or low-level input
13 results in a randomized selection of a codebook excitation vector.

REMARKS

This is in response to the Office Action of 09 August 2002. Claims 1-16 are pending in the application, and Claims 1-16 have been rejected.

Claims 1, 5, 9, and 13 have been amended consistent with the specification.

No new matter has been added.

In view of the remarks below, Applicant respectfully requests reconsideration and further examination.

About The Invention

The present invention relates generally to the field of voice encoding and voice decoding. More particularly, the present invention relates to establishing an input energy threshold for input signals, and randomizing the selection of codebook excitation vectors during the decoding process of full-rate or half-rate encoded frames of speech data wherein the frames include subframes having zero or low-level input. By randomizing the selection of codebook excitation vectors under such circumstances, the generation undesirable audible artifacts is reduced.

Attorney Docket No.

Please update the records of the USPTO to reflect the new attorney docket number for this matter, which is: PHA51214.

Drawings

Applicant submits concurrently herewith a paper entitled Submission of Formal Drawings which includes three sheets of formal drawings corresponding to Figs. 1-3 of the above-referenced application. Applicant submits that these drawings correct the informalities noted in the Notice of Draftsperson's Patent Drawing Review dated 08 October 1999.

Rejections under 35 USC 102(b)

Claims 1-16, have been rejected under 35 USC 102(b) as being anticipated by Tzeng (US Patent 5,293,449).

Tzeng teaches an analysis-by-synthesis approach to recreating speech. More particularly, Tzeng teaches a linear predictive speech codec arrangement including a spectrum synthesizer for providing reconstructed speech generation in response to excitation signals, a distortion analyzer for comparing the reconstructed speech with an original speech, and providing a distortion analysis signal in response to such comparison, and an excitation model circuit receiving and utilizing the distortion analysis signal in an analysis-by-synthesis operation for determining ones of excitation signals which provide an optimal reconstructed speech.

By this response and amendment, Applicants have amended independent Claims 1, 5, 9, and 13 to more specifically recite the limitations of the input signal being encoded at half-rate or greater (e.g., full-rate or half-rate), and that the input signal comprises subframes so encoded which have zero or low-level input values. The amended Claims further recite that each of the subframes having the zero or low-level input values results in a randomized selection of a codebook excitation vector. Support for these amendments can be found generally

throughout the specification, and can more particularly be found at page 12, line 16, through page 13, line 8; and page 15, lines 7-21.

The invention defined by the amended Claims is not determining and then minimizing an error function. Rather, if full or half rate encoded input signals include subframes of zero or low-level input values, then a randomization process may be employed so as to avoid the creation of undesirable artifacts that would occur simply by repeating the same codebook excitation vector for those zero or low-level input values.

For at least the reasons set forth above, Applicants respectfully submit that the rejections of independent Claims 1, 5, 9, and 13 have been overcome. Applicants further submit, in view of the amendments to Claims 1, 5, 9, and 13, that dependent Claims 2-4, 6-8, 10-12, and 14-16 have also been overcome.

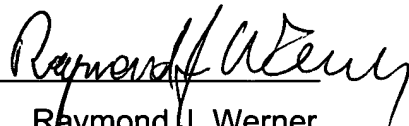
Conclusion

All of the rejections in the outstanding Office Action of 09 August 2002 have been responded to, and Applicants respectfully submit that the pending Claims 1-16 are now in condition for allowance.

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached page is captioned **"Version with markings to show changes made"**.

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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Dated: 10 February 2003
Portland, Oregon

Version with markings to show changes made

In the Claims

1 1. (Amended) A computer implemented method of reducing sinusoidal artifact
2 generation in a vocoder, said computer implemented method comprising the
3 steps of:

4 a) receiving a determined input energy threshold value below which a
5 suspected noise-inducing codebook excitation vector is expected to be generated
6 by said vocoder; and

7 b) provided an input signal is received having an energy value lower than
8 said input energy threshold value, using a selection process to [prevent] **such**
9 **that** said suspected noise-inducing codebook excitation vector from **is not**
10 **[being]** continuously generated;

11 **wherein the input signal comprises a plurality of subframes, the**
12 **subframes encoded at half-rate or greater, at least a portion of the**
13 **subframes have a zero or low-level input, and each of the subframes having**
14 **the zero or low-level input results in a randomized selection of a codebook**
15 **excitation vector.**

1 5. (Amended) In a computer system having a processor coupled to a bus, a
2 computer readable memory unit coupled to said bus and having stored therein a
3 computer program that when executed by said processor causes said computer
4 system to implement a method of reducing sinusoidal artifact generation in a
5 vocoder, said method comprising the steps of:

6 a) receiving a determined input energy threshold value below which a
7 suspected noise-inducing codebook excitation vector is expected to be generated
8 by said vocoder; and

9 b) provided an input signal is received having an energy value lower than
10 said input energy threshold value, using a selection process to [prevent] such
11 that said suspected noise-inducing codebook excitation vector from is not
12 [being] continuously generated;

13 wherein the input signal comprises a plurality of subframes, the
14 subframes encoded at half-rate or greater, at least a portion of the
15 subframes have a zero or low-level input, and each of the subframes having
16 the zero or low-level input results in a randomized selection of a codebook
17 excitation vector.

1 9. (Amended) A computer system comprising:

2 a processor;
3 an address/data bus coupled to said processor;
4 a computer readable memory coupled to communicate with said
5 processor, said processor for performing the vocoder sinusoidal artifact
6 generation reduction steps of:

7 a) receiving a determined input energy threshold value below which a
8 suspected noise-inducing codebook excitation vector is expected to be generated
9 by said vocoder; and

10 b) provided an input signal is received having an energy value lower than

11 said input energy threshold value, using a selection process to [prevent] such
12 that said suspected noise-inducing codebook excitation vector from is not
13 [being] continuously generated;
14 wherein the input signal comprises a plurality of subframes, the
15 subframes encoded at half-rate or greater, at least a portion of the
16 subframes have a zero or low-level input, and each of the subframes having
17 the zero or low-level input results in a randomized selection of a codebook
18 excitation vector.

1 13. (Amended) A method of reducing sinusoidal artifact generation in a vocoder,
2 said method comprising the steps of:

3 a) determining an input energy threshold value below which a suspected
4 noise-inducing codebook excitation vector is expected to be generated by said
5 vocoder; and

6 b) provided an input signal is received having an energy value lower than
7 said input energy threshold value, using a selection process to [prevent] such
8 that said suspected noise-inducing codebook excitation vector from is not
9 [being] continuously generated;

10 wherein the input signal comprises a plurality of subframes, the
11 subframes encoded at half-rate or greater, at least a portion of the
12 subframes have a zero or low-level input, and each of the subframes having
13 the zero or low-level input results in a randomized selection of a codebook
14 excitation vector.